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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/021,039	12/19/2001	Masao Kitagawa	60188-132	9505

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EXAMINER	
TUCKER, WESLEY J	

ART UNIT	PAPER NUMBER
2623	

DATE MAILED: 01/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/021,039	KITAGAWA, MASAO	
	Examiner	Art Unit	
	Wes Tucker	2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 December 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,6,7,10-15 and 18* is/are rejected.

7)☒ Claim(s) *5,8,9,16 and 17* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 December 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *3, 4, 7,and 8*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-4, 6, 7, and 18 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 6,178,205 to Cheung et al.

With regard to claim 1, Cheung discloses A noise reducing apparatus comprising at least one noise reducing section for reducing encoding noise of image data with controllable noise reduction characteristics (column 3, lines 40-45); and a control section for controlling the noise reduction characteristics of the noise reducing section according to at least one of a scale factor for scaling an image represented by the image data and a degree of motion of the image (column 3, lines 45-50). Cheung does not disclose removing noise according to scale but he does disclose a noise removal device that takes into account motion vectors. The control section is considered to be part of the processor that performs filtering according to the motion detected.

With regard to claim 2, Cheung discloses the noise reducing apparatus according to claim 1, wherein the noise reducing section includes at least one of a mosquito noise reducing section for reducing mosquito noise and a blocking artifact reducing section for reducing blocking artifact (column 4, lines 63-67). Cheung discloses reducing blockiness with a filter. Cheung also discloses removing blockiness and mosquito noise (column 1, lines 36-48).

With regard to claim 3, Cheung discloses the noise reducing apparatus according to claim 1, wherein the control section controls the noise reduction characteristics by controlling at least one of noise detection sensitivity and a noise reduction level of the noise reducing section (column 3, lines 50-55). Cheung discloses adaptive filtering depending on the image content and choosing a filter accordingly. The adaptive filtering is interpreted as coinciding with the noise reduction level.

With regard to claim 4, Cheung discloses the noise reducing apparatus according to claim 3, wherein the noise reducing section includes a filter, and the control section controls the noise reduction level by controlling at least one of the number of filter taps and a filter coefficient of the filter (column 5, lines 5-30). Cheung discloses that coefficients and tap numbers are chosen.

With regard to claim 6, Cheung discloses the noise reducing apparatus according to claim 4, wherein the control section controls the number of filter taps and the filter

coefficient so that the noise reduction level is higher when the degree of motion of the image is larger than a prescribed value than when the degree of motion of the image is smaller than the prescribed value (column 5, line 35- column 6, line12). Here Cheung discloses using motion vectors as a measure of motion and using the degree of motion in calculating the filtering function. This operation is considered equivalent because the filter, which determines the noise removal, is determined by the amount of motion as represented in the motion vectors. The motion detected therefore determines the filter coefficients as well as the measure of noise removed.

With regard to claim 7, Cheung discloses the noise reducing apparatus according to claim 4, wherein the control section controls the number of filter taps and the filter coefficient so that input image data to the noise reducing section is the same as output image data from the noise reducing section when noise reduction is not conducted (column 7, lines 24-31). Cheung discloses wherein no temporal filtering or noise removal is performed when the reference value and the coded pixel value are a good match.

With regard to claim 18, the discussion of claim 1 applies. The method is disclosed in the apparatus discussed in claim 1.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 8, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of U.S. Patent 6,178,205 to Cheung et al. and U.S. Patent 5,790,714 to McNeil et al.

With regard to claim 8, Cheung discloses the noise reducing apparatus of claim 1, but does not disclose an extracting section for extracting a prescribed region of a display or a scaling section for scaling by a prescribed scale factor the image data extracted by the extracting section. McNeil discloses an extracting section for extracting image data of a prescribed region from original image data to produce effective display area (column 1, lines 40-54). McNeil also discloses a scaling section for scaling by a prescribed scale factor the image data extracted by the extracting section (column 1, lines 56-63). McNeil also discloses an input/output means that would extract or detect the image and a processor that would calculate the scale factor (column 1, lines 64-67).

It is advantageous to scale an image for display on different displays with different resolutions. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to use scale the image data as taught by McNeil according to

the kind of display to be used in combination with the noise removal of Cheung in order to achieve a quality image.

With regard to claim 9, Cheung discloses the noise reducing apparatus according to claim 1, but does not disclose an original image size detecting section for detecting an original image size from original image data or a scale factor calculating section for calculating a scale factor of the image from the detected original image size and display image size. McNeil discloses an original image detecting section and a scale factor calculating section (column 1, lines 55-63). McNeil discloses that the original video is received and that both vertical and horizontal scaling are used to resize the image and therefore a scale factor must be determined in the process to resize the image and the initial image must be detected in order to initiate the operation. McNeil also discloses an input/output means that would detect the image and a processor that would calculate the scale factor (column 1, lines 64-67).

Cheung does not disclose that the noise reduction control section reduces noise according to the scaling factor. However in the combination of Cheung and McNeil it would be necessary to filter noise according to the scale factor since the scale factor determines the addition of image data and would therefore affect the noise filtering. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to use the scale factor determination taught by McNeil to effectively reduce noise in the noise reduction of Cheung.

Claims 10-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of U.S. Patent 6,178,205 to Cheung et al. and U.S. Patent 6,083,168 to Hossack et al.

With regard to claim 10, Cheung discloses the noise reducing apparatus according to claim 1, further comprising a motion detecting section for obtaining the degree of motion of the image based on values of differences between pixel data of pixels of the same position in at least one pair of successive field images or frame images, the difference being obtained for pixels in at least a part of each field image or each frame image, wherein the control section controls the noise reduction characteristics of the noise reducing section according to output of the motion detecting section (column 7, lines 7-31). Cheung discloses determining the difference between pixels values in two different images or pixel sets and based on those differences motion vectors are determined giving a degree of motion and a corresponding filtering function. Cheung does not disclose wherein the motion is determined by a sum of absolute differences. Hossack teaches that an advantage of using a minimum sum of absolute differences to determine a measure of image motion gives an error signal related to noise in the image (column 10, lines 56-64). Therefore it would have been obvious to one of ordinary skill in the art to use a sum of the absolute difference between images in order to determine a degree of motion and to obtain an error signal related to noise in the image.

With regard to claim 11, Cheung discloses the noise reducing apparatus according to claim 10, but does not disclose wherein the motion detecting section determines a level of the degree of motion of the image from a plurality of levels based on a compared result of the sum with at least one prescribed threshold value, and the control section controls the noise reduction characteristics of the noise reducing section in a plurality of levels according to the level of the degree of motion of the image. Hossack discloses determining a degree of motion from a sum of absolute differences compared with a threshold to determine how to remove noise (column 10, lines 62-67 and column 11, lines 1-20). The use of thresholds to determine a measured degree of a statistic is a well-known technique in the art. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to determine the degree of motion between the two consecutive frame images by taking the sum of absolute differences between the images and comparing that figure to a threshold in order to determine the degree of motion and then removing noise accordingly.

With regard to claim 12, Cheung and Hossack disclose the noise reducing apparatus according to claim 10. Hossack further discloses wherein the motion detecting section obtains the degree of motion of the obtained for image based on a plurality of sums respectively of image pairs a plurality of sums respectively (column 10, lines 62-67 and column 11, lines 1-20). The motion is determined by the difference between the reference pixel value and the present pixel value between successive

frames by way of the sum of absolute differences. It is interpreted that this is an ongoing process and will therefore use a plurality of image pairs.

With regard to claim 13, Cheung and Hossack disclose the noise reducing apparatus according to claim 12. Hossack further discloses wherein the motion detecting section obtains the degree of motion of the image based on a comparison result of each of the sums with at least one prescribed threshold value (column 10, lines 62-67 and column 11, lines 1-20). Hossack discloses determining a degree of motion from a sum of absolute differences compared with a threshold. Since it is an ongoing process in video the comparison is made with each of the sums.

With regard to claim 14, Cheung and Hossack disclose the noise reducing apparatus according to claim 10. Hossack further discloses wherein the control section controls the noise reduction characteristics of the noise reducing section regardless of output of the motion detecting section, in response to a still-state signal indicating a still state in which image data held in an image memory is repeatedly read for display (column 9, lines 32-65). Hossack discloses wherein portions of the image whether moving or non-moving are filtered for noise in the same way to avoid blurring.

With regard to claim 15, Cheung and Hossack disclose the noise reducing apparatus according to claim 10. Hossack discloses further comprising a random noise reducing section for reducing random noise of the image data, based on a difference

between pixel data of pixels of the same position in at least one pair of successive field images or frame images (column 8, lines 60-65 and column 9, lines 1-10).

Hossack further discloses a difference calculating section shared for calculating the difference between pixel data for reducing the random noise by the random noise reducing section and for calculating the difference between pixel data for obtaining the degree of motion of the image by the motion detecting section (column 8, lines 60-65 and column 9, lines 1-10). The differences calculated are used both in removing noise and in determining the amount of motion.

Allowable Subject Matter

Claims 5, 16, and 17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Prior Art

Other prior art considered relevant, but not relied upon is as follows:

U.S. Patent 6,066,980 to Daribi discloses a scaling and filtering of video images that requires different coefficients according to scale.

U.S. Patent 5,424,783 to Wong discloses filtering to remove noise according to the scale of interest of the video image.

U.S. Patent 6,348,929 to Acharya et al. discloses filter coefficients used in scaling a video image in order to remove noise noise and preserve edges.

U.S. Patent 5,570,135 to Gove et al. discloses filtering a video image for television that has been scaled.

IEEE document entitled "Space-Scale Adaptive Noise Reduction in Images Based on Thresholding Neural Network" by Xiao-Ping Zhang discloses removing noise according to image scale.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wes Tucker whose telephone number is 703-305-6700. The examiner can normally be reached on 9AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on (703)308-6604. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Wes Tucker

12-9-2004

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